

# Gender Dynamics in Urban Water Management in Nepal: A Case Study of Dharan

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**Abstract** This paper discusses the gendered roles and responsibilities in water resource management and its implications for urban water management. The results revealed that women are the primary water collectors and that the gendered nature of water collection varies among ethnic groups. Men are not involved in water collection in the Madhesi ethnic group, while they contribute to varying extent in other groups. Dry season is the most critical period for water supply in all four-study locations particularly among squatter communities. Less than 30% of the water demand is fulfilled in Squatter 1, while about 50% is fulfilled in urban areas. Conflicts related to water during collection is frequent in common water points mainly due to illegal and inequitable distribution of water. Results also demonstrated the influence of traditional reliance and informal context on women's access to and performance in the formal decision-making spheres. Women exert influence primarily in household decision making related to water, while beyond households their participation is typically very low. However, formation of water users' groups has motivated women to take on active membership and participate in water management at local and city levels.

**Keywords** Ethnic group, Water collection, Squatter, Water users' group

## 1. Introduction

The scarcity of water is one of the world's most pressing environmental problems [1] as by 2025, two-thirds of the world population could face water stress conditions. Water is essential for all aspects of socio-economic development and for maintaining healthy ecosystems. However, the increasing stress on freshwater resources due to population growth is of serious concern and necessitates a much more careful development, use and management of this crucial resource. Furthermore, rapid urbanization coupled with changes in lifestyles have led to a surge in pressure on water resources particularly in cities of South Asia, thus leading to water scarcity. With socio-economic development and social stratification, water use by higher income groups for drinking, sanitation, hygiene and recreation increases [2].

In the context where urbanization is becoming a reality in the Himalayan region, cities are facing extreme water insecurity due to changing climate and rapid urbanization. South Asian countries suffer the most from physical or

economical water scarcity, as these nations have large segments of vulnerable population who lack coping strategies thus hampering overall social and economic development. Nepal in particular, is the fastest-urbanizing country in the region with an average urban population growth rate of about 7% per year since the 1970s [3,4]. Critical urban water zones that supply essential water are under threat as rainfall patterns become more erratic and cities are slow to develop adaptation strategies. Furthermore, climate change may aggravate existing shortages of water by altering the distribution and nature of precipitation events.

While securing water for cities is a growing challenge, many cities have a poor record in ensuring equitable and inclusive water access. As aptly stated by Aguilar [5]: "Without secure access to and control over natural resources (land, water, livestock, trees), women are less likely to be able to cope with permanent climatic change or be less willing to make investments in disaster mitigation measures". The third goal of the Millennium Development Goals (MDG) deals with equality between men and women in order to promote better and sustainable development. Following the World Women's Conference held in Beijing (1995), gender has become internationally more widely accepted. However, a difference continues to exist between men and women, in access, use and management of water. Such differences have persisted due to the attitudes of water users and other stakeholders towards gender and marginalized groups. In many cases, institutions and policies related to water have

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not changed to reflect the changes in perception on gender, and policies, that address gender needs and practices at the water user level still lag behind [6].

In addition, having women in local water management bodies challenges the prevalent socio-cultural notion that such bodies are a public, hence male's domain, and use of domestic water is a private, female matter [7-9]. This can be explained by conventional notions that have an attitude on gender roles that govern the division of labor and on how men and women relate in the private and public arenas. Given that, women have often been associated with the private sphere and men with the public one [10], incorporation of women in public decision-making spaces does not ensure that their authority will be equivalent to that of men. Furthermore, women may not always deal in the concerns of other women when they occupy official positions [11].

Under these circumstances, the paper addresses two key questions. First, what are the gendered roles and responsibilities in water resource management? Second, what are the implications of gender differences for urban water management? In order to address these key questions, we have selected Dharan Sub-metropolitan city that is having a rapid increase in population exacerbating water scarcity problems, in order to identify gender dimensions of water use; access; control; and water management problems, issues and opportunities in relation to city-level planning.

## 2. Gender as Discourse

According to theory, gender is the socially constructed relationship that separates the ideas about the biological sexes. Giddens provided the definition regarding the differentiation of sex from gender as "sex is biological or anatomical differences between men and women", whereas "gender concerns the psychological, social and cultural difference between males and females" [12]. Therefore, gender is a neutral term that does not intend to specifically at only men or women. How gender based roles are constructed depends on the social, political, cultural, religious and historical context and it refers to socially constructed relationship between man and women. Gender role constructions change over time, in the same way as the rest of society is changing [13]. Furthermore, most societies have a division of labor between the sexes. Certain chores are seen, as female, especially, child nurturing, and many household duties, while others are male coded, such as, cattle production and use of mechanical tools. Gender theory argues that this is not a naturally given order, but socially charged and constructed roles [13].

## 3. Gender Frameworks as Analytical Techniques

While choosing a framework, it is important to understand theoretical underpinnings as each framework differs in its

assumption of what needs to be addressed and analyzed. In examining gender inequalities, gender framework can help further shape thinking on key aspects of gender power relations, research questions, data collection and data analysis. This ultimately helps in assessing key aspects of power relations and gender inequalities. Women's emphasis has been extended into a gender focus of relations between men and women. These relations shape access to resources, control over resources, participation in decision-making activities within households and communities. The recognition of women's role in development came with the publication of Ester Boserup's *Woman's Role in Economic Development* in 1970 where she showed how western aid policies, projects and workers discriminated against women, and that the development activities left women worse off in terms of resources and influence [14]. Women's exclusion in development management lead to the establishment of the concept *gender mainstreaming* and was adopted at the United Nations Fourth World Conference on Women, held in Beijing in 1995.

Gender analysis therefore views relations between men and women as socially shaped differences of roles and expectations that are culturally specific. However, gender relations can change over time thus requiring changes in the views and actions of men as well as women. Harvard Analytical Framework [15] highlights women's instrumental role in development by explaining how projects would be more effective and efficient by considering women's contributions. This framework helps in collecting information at micro-level (i.e. at community and household level). Others focused on women's reproductive, productive and community roles [16]; and the social relations and institutions that govern gender relations inhibiting broader well being and empowerment [17]. The over-simplifications of a household's character often resulted in misunderstandings about gender roles. This rationalizes the understanding of household dynamics to address the issues such as, who deals with and controls labor within households; how rights and access to resources are assigned; and, how the balance between productive and reproductive activities within households is achieved. Caroline Moser identified triple roles for women as reproductive, productive and community managing activities [16]. Reproductive work involves the care and maintenance of the household and its member; productive work involves the goods and services for consumption and trade; and community work involves social events and services, participation in groups and organizations.

Thus, key domains that constitute gender power relations can be understood through the following questions: i) Gender activity profile: This inquires about who does what both at household and community level related to water management (the division of labor and everyday practices); ii) Gender resource profile: This profile clarifies and documents who has access to resources (such as: land, labor, water, seed, extension services etc.) and benefits (education, health services, assets etc.) and who controls their use in

relation to the tasks identified in the activity profile; iii) Influencing factors. This defines and identifies factors that shape differences between men and women including how values are defined (social norms, ideologies, beliefs and perceptions), institutional structures and who decides (nature of government, rules and decision-making, training and education etc.). Access to and control over property are often important determinants of an individual's social status. These domains are not static, but are actively nurtured, maintained or disputed.

Women often do use and have access to water, but few women are involved in its management. Formal "ownership" (i.e., alienation and management) rights to water are predominantly vested in men, in their capacity as household heads. Women, largely responsible for water collection in their communities, are more sensitive to the changes in seasonal and climatic conditions that affect water quantity and accessibility, which make its collection even more time-consuming. Research reported that increased frequency of droughts led to women walking greater distances to collect water, often ranging from 10 to 15 km a day [18]. This confronts women with personal security risks, keeps young girls out of school and imposes an immense physical burden. A few studies from Nepal on traditional community managed irrigation systems exist that do take gender into account in describing water rights [19-21]. Women do not have access to irrigation as individuals, rather through the relationship with their male right holders. It is always likely that women would lose such form of water access upon divorce [22].

## 4. Study Settings and Research Design

Dharan Sub-metropolitan was divided into areas with and without drinking water supply coverage from Nepal Water Supply Cooperation-Dharan (NWSC-D). From the coverage area, ward 7 (core urban area) and 14 (peripheral area) were selected, while from non-coverage area, two slum communities, namely *Bishnu Chowk* (Squatter-1) and *Makalu Basti* (Squatter-2) were selected purposively based on population, location and severity of water problem. In Squatter-1, there was no private connection of pipeline and people depended on public stand post and surface water. While for Squatter-2, there was distribution of water from public stand post as well as water supply as private pipelines from community managed water system. Likewise, in the core urban area people are dependent only on the water supply from NWSC-D, while in the peripheral area, people depend on supply from NDWC-D as well as on natural spring water.

This study involved a mixed method approach including both qualitative and quantitative data. Data collection was conducted through household survey, focus group discussion (FGD), and key informants interview (KII). A reconnaissance survey was carried out in Dharan in order to conceptualize the real situation of ongoing practices

and acquire knowledge of the area. Before the survey, a reconnaissance survey has been conducted in the study area to test the relevance and completeness of the questionnaire. Household survey was conducted including both open and closed-ended questionnaires. Households' sample size in each study sites is presented in Table 1. Systematic sampling process was carried out. Firstly one house was selected randomly and then on the interval of 10 houses, subsequent households were chosen following a route. Thus, the survey comprises around 10% of the total households in each site. Data on gender dimensions of water access, availability; safe drinking and sanitation; priorities and decision making for water use and management within household and community level; women safety; and opportunities for women/marginalized groups were also collected.

Focus group discussions were carried out in separate groups of men and women to avoid the risk of women being reluctant to share information in front of men. A total of eight FGDs were conducted in the study sites, two (one male and one female) in each study site. The data was gathered through three interrelated tools: an activity profile, an access and control profile, and a list of influencing factors. Each tool contains a series of checklists of key questions. The key informants' interview was taken with altogether nine key informants. The key informants were influential local leaders, social mobilizers, user's committee members and municipality personnel to gather information about water sources, availability and ongoing activities and gender dimensions. The data collected from field surveys and focus group discussions were processed and analyzed using descriptive statistics and were presented using graphs and tables.

**Table 1.** Sampling area with respective sample size

Locality	Total households	Sample size
<b>Squatter-1 (Bishnu chowk)</b>	300	30
<b>Squatter-2 (Makalu Basti)</b>	400	40
<b>Core urban area (Ward no 7)</b>	777	77
<b>Peripheral area (Ward 14)</b>	851	85

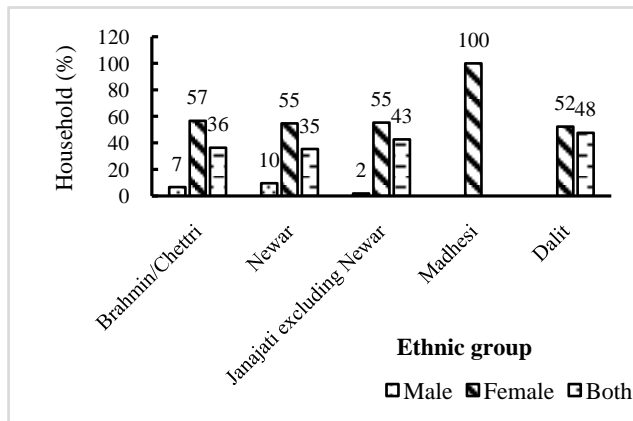
## 5. Results and Discussion

### Water collection

Dry season is the most critical period for water supply in all four-study locations particularly in squatter settlements. Less than 30% of the water demand is fulfilled in Squatter 1, while about 50% is fulfilled in urban areas during the dry period. Carrying water physically is one of the water management roles that seemed reserved for women in this setting. In all four-study areas, women were found to be primary collectors of water, while results also showed that the involvement of men was comparatively higher in squatter-1 and -2 compared to the core urban and peripheral areas. Depending on whether the households received private water supplies, women face the challenge of walking

long distances to draw water. A majority of the respondents (44%) in squatter-1, travel an average distance of 60 m to fetch water for domestic use, while the majority (31%) in squatter-2, travel less than 40 m distance. Likewise, respondents from squatter-1 spent more time for water collection during both dry and wet seasons. On an average, they spent 123 minutes and 71 minutes during the dry and wet seasons, respectively. Whereas, according to respondents, the core area had the lowest average time taken to collect compared to other three areas. On an average, they spent around half an hour during the wet season and nearly one hour during the dry season. Participants of the focus group discussion mentioned that the challenge of walking long distances for water collection has restricted women from participating in other community activities. However, in some settings, it is the duty of men to carry water as it reveals masculine qualities of physical strength [23]. Both men and women respondents of squatter-1 and -2 justified the higher involvement of men in water collection by the need to travel long distances, which demands greater physical strength.

The gendered nature of water collection varies with different ethnic groups. Solely women were involved for water collection in *Madhesi* ethnic group, where no men were found involved in water collection, followed by *Brahmin/Chettri*. Furthermore, both men and women were found involved in water collection in all ethnic groups except the *Madhesi* (Figure 1).



**Figure 1.** Gender-based involvement in water collection in various ethnic groups

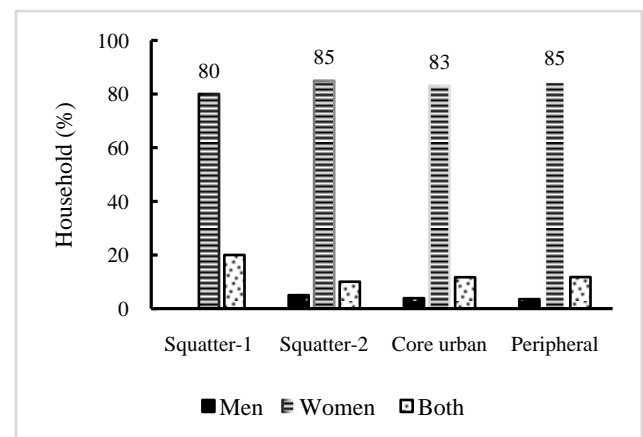
### Water conflict

Conflicts related to water during collection are frequent in common points of water, which include public taps, stone spout and groundwater. The conflict arises mainly due to illegal and inequitable distribution of water. Respondents reported that the occurrences of conflict mainly take place in squatter communities rather than in core urban and peripheral areas. A key reason for this could be due to high water scarcity leading to competition for the resource limits.

Moreover, women are more involved in water conflict than men as this tends to occur mainly at the point of collection. During FGDs, it was reflected that the direct impact of water scarcity was felt by women, whereas, economic burden associated with water scarcity including water quality and quantity were mostly reported by men. The situation of water scarcity is likely to worsen in future with increasing population and drying of water sources as reported by the local communities. This will undoubtedly lead to further conflict situations.

### Gender involvement in decision-making water management activities

Women mostly make water management decisions at the household level (Figure 2). The majority of the respondents (more than 80%) mentioned that women are involved in household decision-making process related to water (Figure 2). During group discussions women mentioned that due to their domestic roles such as cooking, collecting water, taking care of the children and family, among others chores, their public life has been severely limited. The involvement of gender at community level was analyzed based on their participation in Water User's Group (WUG). The WUGs existed in all study locations except in the core urban area. The participants of FGDs and KII shared that the formation of WUGs has motivated women to become active members and encouraged their participation in the discussion and decision-making related to water management at the community level. Although the number of women members is higher in Water User's Group in squatter 2, when it comes to decision-making beyond household such as, decision regarding water tariff allocation, collection and decision regarding new connections, men's participation is higher (Table 2 showed the participation of both gender in various activities of water management). Exceptionally, one of the water user's group in peripheral area (*Beldada Khanepani Upabokta Samitti*), however, has equal involvement of women as men in all activities.



**Figure 2.** Gender distribution in water management decision-making at household level

**Table 2.** Gender participation in water management activities

Elements	Squatter-1	Squatter-2	Core urban	Peripheral
Water User's Group	One User's Group for each public stand post	Yes	No	Yes (2 groups: A and B)
Members	-	13 Women/ 6 Men	-	Group A: 4 men/5 women Group B: 7 men/2 women
Participation in Meetings	Mostly Men	Mostly Women	-	Group A: Mostly women Group B: Mostly men
Designing (Planning, searching for sources, managing human and other resource)	Men	Both	-	Group A: Both Group B: Mostly men
Construction	Men (Hiring Labour)	Both	-	Group A: Both Group B: Mostly men
Operation (Water tariff allocation, collection, checking connection and source regularly)	-	Mostly Men	-	Group A: Both Group B: Mostly men
Decision making (Related to changes in water tariff, new connection)	Mostly Men	Both but Mostly men	-	Group A: Both Group B: Mostly men

### ***General perception regarding gender-based participation in water management***

During the focus group discussion, women reported that UNICEF had helped them in developing a water system in which they also provided training to the community on water management. Before this, the participation of women in water management was very rare. Even at the initial phase women nominated into water management committees were mostly formalities to fulfill the criteria of UNICEF and not to voice their opinion. But later women started sharing their opinions in the committee. The training provided by UNICEF regarding water management has helped women further to develop confidence, leadership and decision-making power. In general, however, women, in the study areas, also perceived community work to be men's work and men's decision to be correct. Women are busy in multiple tasks at the household, thus they think that it is a burden to be in community work. Women also tend to regard themselves as physically weak for operation, maintenance and construction work, for which they have to depend on men, and would, otherwise could not take place in a timely manner. While in some areas, women are mainly involved in water management activities simply because their male members are mostly out of country for work and not out of choice.

## **6. Discussion and Conclusions**

Our findings imply that the creation of formal opportunities to involve women in the domestic water decision-making structures does not necessarily assure women's participation and gender-responsive services. The gender-base differences in household roles and social spheres with respect to action and decision making of water related activities are found in Dharan. The water demand

during wet and dry seasons are fulfilled in different proportions, with critical shortages during the dry period (typically November through May). However, water demand per capita is also influenced by their income, education and family size. Our findings also suggest that the involvement in water collection activities is dependent on social differences along the line of ethnicity. Such a trend, in fact, underpins social imbalances rather than transforming them. The time spent by women in collecting water is known to have significant implications for their quality of life. The complex gender issue has significant implications for new institutions promoting involvement of women in water governance. Women tend to lack motivation when it comes to designing, operating and decision-making because they think it is not their task. The results also exposed the layered and circumstantial nature of the boundaries between formal and informal structures. More specific norms may provide some women with a better bargaining position. We observed that among women whose husbands are away for work, the gender norms were less restricting. In another context, studies found that mainly elderly women were involved in community leadership [7]. Such gender intersectionalities are deeply rooted in conventional frameworks and influence representation of women [24].

It is assumed that since domestic water procurement is the responsibility of women, decisions both at household and beyond the household, are made in the best interest of women. However this was not the case in our study. In most contexts, previous studies showed that women play important roles as household water managers [25], however, we found that women are mostly involved in household decision making related to water, while beyond the households, their participation is generally very low. More specifically, while women are generally responsible for all decisions regarding domestic water management, men are expected to shoulder the responsibility for formal

decision-making with regard to operation, maintenance and overall decision-making of water resource. Harvey and Reed observed, "women are often concerned about the operation of their water supply and are motivated to do something about it because it directly affects them" [26]. However, the types of water governance activities women engage in show gender-specific patterns. A study by Bhandari & Grant found that women were involved in cleaning around tap-stands but they did not have any role related to finance and management in local water governance [8]. Maintenance and management of water sources is still seen as the men's work arena [7].

This illustrates that women's participation and representation in decision-making position does not necessarily safeguard women's interests as was also reported by [27]. It also depends on the power relations between the woman and her husband and his attitude as head of the household [11]. The norms and values reinforcing intra-household relationships shape the negotiations between men and women [17,28,29].

Clearly, it is likely to be difficult to bring about change if such conventional gender roles are endlessly reproduced. However, interactions of individual agencies and structures may bring about positive change [30]. The hierarchy, status and perceptions on socially appropriate behavior in public spheres shape the involvement of men and women in community governance [11,31]. Moreover, patriarchal culture systems obstruct women's groups from participating in and speaking up in the public spheres [32]. The traditional reliance on men for decision making with respect to issues that are socially classified as lying outside the domestic sphere, may thus explain women's absence or silence in meetings. However, attending meetings is, nonetheless, an important practice as "passive" participation, can eventually pave the way for more "active" participation in decision-making [33]. Such exposure for women in one of our study communities seemed to help them to become motivated and put forth their views in public, as well as, devise tactics to get their views across in decision-making. The WUGs is another venue that facilitates structural change through women's agency. In our study, in peripheral areas, there exists two WUGs and the participation of women in all activities related to water management is also higher. However, greater impacts are achieved when labor division is characterized by reciprocity, when men and women undertake complementary activities.

Our findings on women's participation in water resource management do not deviate substantially from the general picture existing in the literature despite women being members of WUGs. In most instances, they are described as merely "committee members" with only "supportive" positions in the committees [34,26]. For gender integration in water management, there is an urgent need for changes at the individual, household, community and state levels. Moreover, there is a need to understand the nature of gendered participation within dominant gender institutions that govern their interests and preferences as a group. Therefore, a holistic analysis of the factors that hinders

women's participation from being meaningful and less symbolic is required at a broad level.

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